TRAINING CURRICULUM and LESSON PLANS

EMT-B MEDICATION Endorsement

Curriculum Objectives and Sample Lesson Plans
for the EMT-Basic Medication Endorsement

Montana Department of Labor and Industry
Board of Medical Examiners

The purpose of the Medication Endorsement for EMT-B is to provide the EMT-B with the knowledge and skills to carry and administer medications that they are currently only able to assist with.

Patient care should always be based on patient presentation and Montana Prehospital Treatment Protocols.

ENDORSEMENT: Medications

General description:
Allows EMT-Basic to carry and administer mediations previously that the patient had to provide the EMT-B. Including EPI (for anaphlitic reactions), nitro (for chest pain) and bronchodilators-beta agonist (for difficultly breathing), glucagon and glucose for diabetic emergencies .

COGNITIVE OBJECTIVES
At the completion of this unit, the EMT-Basic with the Medication Endorsement will be able to:

1-3.1	Review the specific anatomy and physiology pertinent to pharmacology. (C-1)
1-3.2	Discuss the standardization of drugs. (C-1)
1-3.3	Differentiate among the chemical, generic (nonproprietary), and trade (proprietary) names of a drug. (C-3)
1-3.4	List the four main sources of drug products. (C-1)
1-3.5	Describe how drugs are classified. (C-1)
1-3.6	List the authoritative sources for drug information. (C-1)
1-3.7	Discuss special consideration in drug treatment with regard to pregnant, pediatric and geriatric patients. (C-1)
1-3.9	List and describe general properties of drugs. (C-1)
1-3.10	List and describe liquid, solid, and gas drug forms. (C-1)
1-3.11	List and differentiate routes of drug administration. (C-3)
1-3.12	Differentiate between enteral and parenteral routes of drug administration. (C-3)
1-3.13	Describe mechanisms of drug action. (C-1)
1-3.16	Discuss considerations for storing drugs. (C-1)
1-3.17	List the components of a drug profile. (C-1)
1-3.18	List and describe drugs which the EM-B may administer in a pharmacological management plan according to local protocol. (C-1)
1-4.1	Review the specific anatomy and physiology pertinent to medication administration. (C-1)
1-4.2	Review mathematical principles. (C-1)
1-4.3	Review mathematical equivalents. (C-1)
1-4.4	Differentiate temperature readings between the Centigrade and Fahrenheit scales. (C-3)
1-4.5	Discuss formulas as a basis for performing drug calculations. (C-1)
1-4.6	Calculate oral and parenteral drug dosages for all emergency medications administered to adults, infants and children. (C-2)

1-4.7 Calculate intravenous infusion rates for adults, infants, and children. (C-2)
1-4.8 Discuss legal aspects affecting medication administration. (C-1)
1-4.9 Discuss the "six rights" of drug administration and correlate these with the principles of medication administration. (C-1)
1-4.10 Discuss medical asepsis and the differences between clean and sterile techniques. (C-1)
1-4.11 Describe use of antiseptics and disinfectants. (C-1)
1-4.12 Describe the use of universal precautions and body substance isolation (BSI) procedures when administering a medication. (C-1)
1-4.15 Describe the indications, equipment needed, techniques utilized, precautions, and general principles of administering medications by the inhalation route. (C-3)
1-4.16 Differentiate among the different dosage forms of oral medications. (C-3)
1-4.17 Describe the equipment needed and general principles of administering oral medications. (C-3)
1-4.21 Differentiate among the different percutaneous routes of medication administration. (C-3)
1-4.23 Describe disposal of contaminated items and sharps. (C-1)

PSYCHOMOTOR OBJECTIVES

At the completion of this unit, the EMT-Basic with the Medication Endorsement will be able to:

1-4.32 Use universal precautions and body substance isolation (BSI) procedures during medication administration. (P-2)
1-4.35 Demonstrate clean technique during medication administration. (P-3)
1-4.36 Demonstrate administration of medications by the inhalation route. (P-2)
1-4.37 Demonstrate administration of oral medications. (P-2)
1-4.39 Demonstrate preparation and administration of approved parenteral medications. (P-2)
1-4.40 Demonstrate utilization of a nebulizer in administration of approved inhaled medications
1-4.41 Perfect disposal of contaminated items and sharps. (P-3)

LESSON PLAN:

RECOMMENDED TIME TO COMPLETE:

5 hours, which combines, part lecture overview and skills practice, but does not include clinical requirements.

EQUIPMENT:

Equipment to include but not be limited to:

BSI Equipment (gloves, gown, mask, etc)
IV Infusion Arm
Auto Injector Trainer
Inhaler Trainer
Nebulizer Equipment
Breath Spray and or breath mints (to simulate Nitro)
Gauze Pads (2x2, etc)
Alcohol Preps or similar substitute
Sharps Container
Expired medications (glucagon, nitro, etc)
Jumpkit (assessment materials, B/P cuff stethoscope, etc)

DECLARATIVE:

Overview - the importance of medications and the dangers associated with their administration.

Medications (that may carried on the EMS unit)

A. Epinephrine (auto injector)
B. Nitroglycerin (tablets and spray)
C. Albuterol, Isoetharine, Metaproteranol, etc. (inhaler / nebulizer)
D. Glucagon / Oral Glucose

Medication Names

A. Generic
    1. The name listed in the U.S. Pharmacopedia, a governmental publication listing all drugs in the U.S.
    2. Name assigned to drug before it becomes officially listed. Usually a simple form of the chemical name.
    3. Give examples.
B. Trade
    1. Brand name is the name a manufacturer uses in marketing the drug.
    2. Give examples.

Indications - the indication for a drug's use includes the most common uses of the drug in treating a specific illness.

Contraindications - situations in which a drug should not be used because it may cause harm to the patient or offer no effect in improving the patient's condition or illness.

Medication Form

A. Medications the EMT-Basic carries on the unit.

Compressed powders or tablets - nitroglycerin
Liquids for injection - epinephrine
Gels - glucose
Suspensions - activated charcoal
Fine powder for inhalation - prescribed inhaler
Gases - oxygen
Sub-lingual spray - nitroglycerin
Liquid/vaporized fixed dose nebulizers

B. Each drug is in a specific medication form to allow properly controlled concentrations of the drug to enter into the blood stream where it has an effect on the target body system.

Dose - state how much of the drug should be given.

Administration - state route by which the medication is administered such as oral, sublingual (under the tongue), injectable, or intramuscular.

Actions - state desired effects a drug has on the patient and/or his body systems.

Side Effects - state any actions of a drug other than those desired. Some side effects may be predictable.

Re-assessment strategies

A. Repeat baseline vital signs.
B. Must be done as part of the on-going patient assessment.
C. Documentation of response to intervention.

Medications (for the inhaler/nebulizer)

A. Prescribed inhaler and/or nebulizer
1. Medication name
a. Generic - albuterol, isoetharine, metaproteranol, etc.
b. Trade - Proventil, Ventolin, Bronkosol, Bronkometer, Alupent, Metaprel, etc.
2. Indications - meets all of the following criteria:
c. Exhibits signs and symptoms of respiratory emergency,
d. Has handheld inhaler or nebulizer, and
e. Specific authorization by medical direction.
3. Contraindications
f. Inability of patient to use device.
g. Inhaler is not prescribed for the patient.
h. No permission from medical direction.
i. Patient has already met maximum prescribed dose prior to EMT-Basic arrival.

4. Medication form - handheld metered dose inhaler or nebulizer
5. Dosage - number of inhalations based upon medical direction's order or physician's order based upon consultation with the patient.
6. Administration
    j. Obtain order from medical direction either on-line or off-line.
    k. Assure right medication, right patient, right route, patient alert enough to use inhaler.
    l. Check the expiration date of the inhaler.
    m. Check to see if the patient has already taken any doses.
    n. Assure the inhaler is at room temperature or warmer.
    o. Shake the inhaler vigorously several times.
    p. Remove oxygen adjunct from patient.
    q. Have the patient exhale deeply.
    r. Have the patient put his lips around the opening of the inhaler.
    s. Have the patient depress the handheld inhaler as he begins to inhale deeply.
    t. Instruct the patient to hold his breath for as long as he comfortably can (so medication can be absorbed).
    u. Replace oxygen on patient.
    v. Allow patient to breathe a few times and repeat second dose per medical direction.
    w. If patient has a spacer device for use with his inhaler, it should be used. A spacer device is an attachment between inhaler and patient that allows for more effective use of medication.
7. Actions - Beta agonist bronchodilators - dilates bronchioles reducing airway resistance.
8. Side effects
    a. Increased pulse rate
    b. Tremors
    c. Nervousness
9. Re-assessment strategies
    a. Gather vital signs and focused reassessment.
    b. Patient may deteriorate and need positive pressure artificial ventilation.
10. Infant and child considerations
    a. Use of handheld inhalers is very common in children.
    b. Retractions are more commonly seen in children than adults.
    c. Cyanosis (blue-gray) is a late finding in children.
    d. Very frequent coughing may be present rather than wheezing in some children.
    e. Emergency care with usage of handheld inhalers is the same if the indications for usage of inhalers are met by the ill child.

Medication - Nitroglycerin

A. Nitroglycerin
    1. Medication name
        a. Generic - nitroglycerin
        b. Trade - Nitrostat
    2. Indications - must have all of the following criteria:
        a. Exhibits signs and symptoms of chest pain,
        b. Has physician prescribed sublingual tablets, and
        c. Has specific authorization by medical direction.
    3. Contraindications
        a. Hypotension or blood pressure below 100 mmHg systolic.
        b. Head injury
        c. Infants and children
        d. Patient has already met maximum prescribed dose prior to EMT-Basic arrival.
    4. Medication form - tablet, sub-lingual spray
    5. Dosage - one dose, repeat in 3-5 minutes if no relief, BP > 100, and authorized by medical direction up to a maximum of three doses.
    6. Administration
        a. Obtain order from medical direction either on-line or off-line.
        b. Perform focused assessment for cardiac patient.
        c. Take blood pressure - above 100 mmHg systolic.
        d. Contact medical control if no standing orders.
        e. Assure right medication, right patient, right route, patient alert.
        f. Check expiration date of nitroglycerin.
        g. Question patient on last dose administration, effects, and assures understanding of route of administration.
        h. Ask patient to lift tongue and place tablet or spray dose under tongue (while wearing gloves) or have patient place tablet or spray under tongue.
        i. Have patient keep mouth closed with tablet under tongue (without swallowing) until dissolved and absorbed.
        j. Recheck blood pressure within 2 minutes.
        k. Record activity and time.
        l. Perform reassessment.
    7. Actions
        a. Relaxes blood vessels
        b. Decreases workload of heart
    8. Side effects
        a. Hypotension
        b. Headache
        c. Pulse rate changes
    9. Reassessment strategies
        a. Monitor blood pressure.
        b. Ask patient about effect on pain relief.
        c. Seek medical direction before re-administering.

d. Record reassessments.

Medication - Oral Glucose and Glucagon

A. Oral Glucose and Glucagon
1. Medication Name (Glucose)
    a. Generic - Glucose, Oral
    b. Trade - Glutose, Insta-glucose
2. Mediation Name (Glucagon)
    a. Generic - Glucagon
    b. Trade - Glucagon
3. Indications - patients with altered mental status with a known history of diabetes.
    a. Glucose reading less than _____.
    b. Unable to obtain glutose readings and patient is unconscious and unable to swallow.
4. Medication form
    a. Glucose – Gel, in toothpaste type tubes
    b. Glucagon – injection subcutaneous and intramuscularly
5. Dosage
    a. Glucose – one tube
    b. Glucagon – 1mg (patients weighing more than 44lb)
6. Administration – oral glucose
    a. Obtain order from medical direction either on-line or off-line.
    b. Assure signs and symptoms of altered mental status with a known history of diabetes.
    c. Assure patient is conscious and can swallow and protect their airway.
    d. Administer glucose.
        (1) Between cheek and gum.
        (2) Place on tongue depressor between cheek and gum.
    e. Perform ongoing assessment.
7. Administration – Glucagon
    a. Remove flip off seal from the bottle of glucagon Wipe rubber stopper on bottle with alcohol swab.
    b. Remove the needle protector from the syringe and inject the entire contents of the syringe into the bottle of glucagon . Do not remove the plastic clip from the syringe. Remove syringe from the plastic bottle.
    c. Swirl bottle gently until glucagon dissolves completely. Glucagon should not be used unless the solution is clear and of a water-like consistency.
    d. Using the same syringe hold bottle upside down and making sure the needle tip remains in the solution gently withdraw all of

the solution from the bottle (1 mg make on the syringe) USE SOLUTION IMMEDIATLEY AFTER MIXING.

e. Cleanse injection site on buttock, arm, or thigh with alcohol swab
f. Insert the needle into the loose tissue under the cleansed site and inject all of the glucagon solution. There is no danger of overdose.
g. Apply light pressure at the injection site and withdraw the needle. Press an alcohol swab on site.
h. ALWAYS turn the patient on to their side because as they awake they may vomit.
i. Feed the patient a fast acting sugar and a long acting sugar source as soon as the patient can maintain their airway.
j. If the patient does not awaken within 15 minutes, contact medical control immediately.

8. Actions - increases blood sugar
9. Side effects – Glucose
    a. None when given properly. May be aspirated by the patient without a gag reflex.
10. Side effects – Glucagon
    a. Nausea and vomiting
    b. Rapid heart rate (very rare)
11. Re-assessment strategies - if patient loses consciousness or seizes,

Medications – Epinephrine

A. Epinephrine auto-injector
1. Medication name
    a. Generic - Epinephrine
    b. Trade - Adrenalin
2. Indications - must meet the following three criteria:
    a. Emergency medical care for the treatment of the patient exhibiting the assessment findings of an allergic reaction.
    b. Medication is prescribed for this patient by a physician.
    c. Medical direction authorizes use for this patient.
3. Contraindications - no contraindications when used in a life-threatening situation.
4. Medication form - liquid administered via an automatically injectable needle and syringe system only.
5. Dosage
    a. Adult - one adult auto-injector (0.3 mg)
    b. Infant and child - one infant/child auto-injector (0.15 mg)
6. Administration
    a. Obtain order from medical direction either on-line or off-line.
    b. Assure medication is not discolored (if able to see).

c. Remove safety cap from the auto-injector.
d. Place tip of auto-injector against the patient's thigh.
(1) Lateral portion of the thigh.
(2) Midway between the waist and the knee.
e. Push the injector firmly against the thigh until the injector activates.
f. Hold the injector in place until the medication is injected (10 seconds).
g. Record activity and time.
h. Dispose of injector in biohazard container.

3. Actions
a. Dilates the bronchioles.
b. Constricts blood vessels.

4. Side effects
a. Increases heart rate
b. Pallor
c. Dizziness
d. Chest pain
e. Headache
f. Nausea
g. Vomiting
h. Excitability, anxiousness

5. Re-assessment strategies
a. Transport.
b. Continue focused assessment of airway, breathing and circulatory status.
(1) Patient condition continues to worsen.
(a) Decreasing mental status
(b) Increasing breathing difficulty
(c) Decreasing blood pressure
(d) Obtain medical direction
i) Additional dose of epinephrine.
ii) Treat for shock (hypoperfusion).
iii) Prepare to initiate Basic Cardiac Life support measures.
- CPR
- AED
(2) Patient condition improves. Provide supportive care.
(a) Oxygen
(b) Treat for shock (hypoperfusion).